CLAIMS

1. A planetary transmission (1), especially a dual clutch transmission, based on planetary gear construction, with a plurality of planetary gear sets (P1, P2, P3, P4), having at least two frictional shifting elements (K1, K2) for the up-shifting of different power paths in a power flow and with a plurality of shape-fit, shifting elements (A to F) for the attainment of various ratio stages in the said power paths, whereby the frictional shifting elements (K1, K2) and the shape-fit, shifting elements (A to F) are so positioned between shafts (S1 to S4, ST1 to ST4, HR1 to HR4) of the planetary gear sets (P1 to P4), a housing (2), a transmission input shaft (3) and a transmission output shaft (4), that gear stage change, at least in a lower gear range ("1" to "6"), can be accomplished in a manner free of interruption of traction and wherein at least one of the frictional shifting elements (K1, K2) is designed as a clutch, therein characterized, in that the second planetary gear set (P2), a third planetary gear set (P3) and a fourth planetary gear set (P4) form a 3-carrier-5-shaft transmission apparatus, which is constructed with separate planetary gears (PR2 to PR4).

2. A planetary transmission (1), especially a dual clutch transmission, based on planetary gear construction, with a plurality of planetary gear sets (P1, P2, P3, P4), having at least two frictional shifting elements (K1, K2) for the up-shifting of different power paths in a power flow and with a plurality of shape-fit, shifting elements (A to F) for the attainment of various ratio stages in the said power paths, whereby the frictional shifting elements (K1, K2) and the shape-fit, shifting elements (A to F) are so positioned between shafts (S1 to S4, ST1 to ST4, HR1 to HR4) of the planetary gear sets (P1 to P4), a housing (2), a transmission input shaft (3) and a transmission output shaft (4) that gear stage change, at least in a lower gear range ("1" to "6"), can be accomplished by the said friction shifting elements (K1, K2) in a manner free of interruption of traction and wherein at least one of the frictional shifting elements (K1, K2) is designed as a clutch, therein characterized, in that a second planetary gear set (P2), a third planetary gear set (P3) and a fourth planetary gear set (P4) form a reduced 3-carrier-5-shaft-

transmission apparatus, with which two planetary gear sets (P2, P3) are bound together by dual planetary gears (P23) without stepping.

3. A planetary transmission in accord with claim 1 or 2, therein characterized, in that at least one of the frictional shifting elements (K2) is serving as a brake.

4. A planetary transmission in accord with one of the claims 1 to 3, therein characterized, in that the friction elements (K1, K2) can be designed to run wet or dry.

5. A planetary transmission in accord with one of the claims 1 to 4, therein characterized, in that the shape-fit, shifting elements (A to F) function as synchronized shifting elements.

6. A planetary transmission in accord with one of the claims 1 to 5, therein characterized, in that the frictional shifting elements (K1, K2) in the area of the transmission input and the shape-fit, shifting elements (B1, B2, C, D, E1, E2, F) are placed between the frictional shifting elements (K1, K2) and the the transmission output shaft (4).

7. A planetary transmission in accord with one of the claims 1 to 6, therein characterized, in that a first planetary gear set (P1) is designed as a simple planetary gear set.

8. A planetary transmission in accord with claim 7, therein characterized, in that, one of the shafts (ST1) of the first planetary gear set (P1) can be operationally connected to the transmission input shaft (3) by the second frictional shifting element (K2).

9. A planetary gear transmission in accord with claim 7 or 8, therein characterized, in that, one of the shafts (ST1) of the first planetary gear set (P1) is bound to the transmission input shaft (3) and an additional shaft (S1) of the first planetary gear set (P1) can be arrested in motion by the second frictional shifting element (K2) acting against a housing-affixed component (2).

10. A planetary transmission in accord with one of the claims 8 or 9, therein characterized, in that one of the shafts (ST1) of the first planetary gear set (P1) is connected with the transmission input shaft (3) and an additional shaft (HR1) of the

first planetary gear set (P1), by the second frictional shifting element (K2) can be brought into operational communication with a shaft (S2) of a second planetary gear set (P2).

11. A planetary transmission in accord with one of the claims 1 to 10, therein characterized, in that the carrier (ST2) of a second planetary gear set (P2) is connected with the carrier (ST3) of a third planetary gear set (P3) and the internal gear (HR2) of the second planetary gear set (P2) is bound to the internal gear (HR3) of the third planetary gear set (P3).

12. A planetary transmission in accord with claim 11, therein characterized, in that the internal gear (HR3) of the third planetary gear set (P3) is connected to the carrier (ST4) of the fourth planetary gear set (P4).

13. A planetary transmission in accord with claim 11 or 12, therein characterized, in that the sun gear (S3) of the third planetary gear set (P3) and the sun gear (S4) of the fourth planetary gear set (P4) are connected together.

14. A planetary transmission in accord with one of the claims 11 to 13, therein characterized, in that the internal gear (HR4) of the fourth planetary gear set (P4) can be connected with a housing-affixed component (2) by a shape-fit, shifting element (A).

15. A planetary transmission in accord with one of the claims 11 to 14, therein characterized, in that the carrier (ST4) of the fourth planetary gear set (P4) is bound to the transmission output shaft (4).

16. A planetary transmission in accord with one of the claims 11 to 15, therein characterized, in that the carrier (ST2) of the second planetary gear set (P2) can be connected with a housing-affixed component by a shape-fit, shifting element (D).

17. A planetary transmission in accord with one of the claims 11 to 16, therein characterized, in that the sun gear (S2) of the second planetary gear set (P2) can be connected with the internal gear (HR1) of the first planetary gear set (P1) by a shape-fit, shifting element (B2).

18. A planetary transmission in accord with one of the claims 11 to 17, therein characterized, in that the sun gear (S2) of the second planetary gear

set (P2) can be connected with the internal gear (HR1) of the first planetary gear set (P1) and with the carrier of the (ST3) of the third planetary gear set (P3) by two shape-fit, shifting elements (B2, E2).

19. A planetary transmission in accord with one of the claims 11 to 18, therein characterized, in that the sun gear (S3) of the third planetary gear set (P3), by shape-fit, shifting element (B1) and the first frictional shifting element (K1), can be connected with the transmission input shaft (3).

20. A planetary transmission in accord with one of the claims 11 to 19, therein characterized, in that the transmission input shaft (1), by the first frictional shifting element (K1) and a shape-fit, shifting element (F) can be connected with the transmission output shaft (4).

21. A planetary transmission in accord with one of the claims 11 to 20, therein characterized, in that the sun gear (S3) of the third planetary gear set (P3) can be brought into operational connection with the carrier (ST1) of the first planetary gear set (P1) by two shape-fit, shifting elements (B1 and E2) and the two frictional shifting elements (K1, K2).

22. A planetary transmission in accord with one of the claims 11 to 21, therein characterized, in that the sun gear (S2) of the second planetary gear set (P2), by shape-fit, shifting element (C) can be connected to a housing-affixed component (2).

23. A planetary transmission in accord with one of the claims 11 to 22, therein characterized, in that the second planetary gear set (P2) and the third planetary gear set (P3) form a planetary gear set (P23) with a common carrier (ST23) and a common internal gear (HR23), whereby the planetary gears (PR23), secured in bearings on the carrier (ST23), are in tooth engagement with sun gear (S2) of the second planetary gear set (P2) and the sun gear (S3) of the third planetary gear set (P3).

24. A planetary transmission in accord with claim 23, therein characterized, in that, the internal gear (HR23) of the planetary gear set (P23) is connected to the carrier (ST4) of the fourth planetary gear set (P4).

25. A planetary transmission in accord with one of the claims 11 to 24, therein characterized, in that, at least a part of the shape-fit, shifting elements (F, B1, E1) can be shifted by shifting collars (8, 14), which extend from the housing (2) into the interior of the said housing (2), by a connection shaft (9) which runs between the first planetary gear set (P1) and the additional planetary sets (P2 to P4), thereby engaging the synchronizing rings (5, 13) which in turn engage the shifting elements (F, B1, E1).